

# Curriculum Vitae

## Mahdi Nikdast

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## 1 Personal Information

### 1.1 Contact Information

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 Web: <http://www.engr.colostate.edu/~mnikdast>

### 1.2 Education

<i>Degree</i>	<i>Date</i>	<i>University</i>
Ph.D.	June 2014	Hong Kong University of Science and Technology (HKUST)
B.Sc.(Hons)	May 2009	Azad University, Iran

#### *Doctoral Dissertation:*

Signal-to-noise Ratio (SNR) in Optical Interconnection Networks: Analysis, Modeling, and Comparison  
 Ph.D. Advisor: Prof. Jiang Xu

### 1.3 Awards and Honors

- [1] IEEE Council on Electronic Design Automation (CEDA), Ernest S. Kuh Early Career Award, 2024.
- [2] Colorado State University, Best Teacher Award (Nominated), Fort Collins, CO, 2023.
- [3] Colorado State University, George T. Abell Award for Teaching and Mentoring, Fort Collins, CO, 2023.
- [4] Colorado State University, Walter Scott, Jr. College of Engineering Rockwell-Anderson Professorship, Fort Collins, CO, 2022.
- [5] Colorado State University, George T. Abell Award for Outstanding Early-Career Faculty, Fort Collins, CO, 2022.
- [6] National Science Foundation (NSF) Faculty Early Career Development Program (**CAREER**) Award, 2021.
- [7] Winner of the design contest for first-time users of imec silicon nitride photonics technology (BioPIX300), 2021.
- [8] ACM Great Lakes Symposium on VLSI (GLSVLSI) **Best Paper Honorable Mention Award** for the paper "LORAX: Loss-Aware Approximations for Energy-Efficient Silicon Photonic Networks-on-Chip," Beijing, China, 2020.
- [9] Colorado State University Demo Day Forum **Best Poster People's Choice Award** for the poster "Eye of Horus (EoH): An Automated Real-Time Surveillance System to Protect Citizens," Fort Collins, CO, 2019.

- [10] ACM Great Lakes Symposium on VLSI (GLSVLSI) **Best Paper Award Finalist** for the paper “DeEPeR: Enhancing Performance and Reliability in Chip-Scale Optical Interconnection Networks,” Chicago, IL, 2018.
- [11] IEEE Design Automation and Test in Europe (DATE) Conference and Exhibition - Test and Robustness Track **Best Paper Award** for the paper “Modeling Fabrication Non-Uniformity in Chip-Scale Silicon Photonic Interconnects,” Dresden, Germany, 2016.
- [12] IEEE/ACM Design Automation Conference (DAC) Travel Grant, Austin, TX, 2016.
- [13] Natural Sciences and Engineering Research Council of Canada (NSERC) CREATE Postdoctoral Fellowship (SiEPIC Program), Montreal, Canada, 2015–2017.
- [14] IEEE/Optica Asia Communications and Photonics (ACP) Conference - The Optical Society **Best Paper Award** for the paper “Photonic Integrated Circuits under Process Variations,” Hong Kong, 2015.
- [15] IEEE Design Automation and Test in Europe (DATE) Conference and Exhibition - Ph.D. Forum Travel Grant, Grenoble, France, 2015.
- [16] Regroupement Strategique en MicroSystemes du Quebec (ReSMiQ) Postdoctoral Fellowship, Montreal, Canada, 2014–2016.
- [17] IEEE/ACM Design Automation Conference (DAC) - Ph.D. Forum Travel Grant, San Francisco, CA, 2014.
- [18] HKUST School of Engineering Fellowship for Outstanding Graduate Students, Hong Kong, 2012–2013.
- [19] HKUST Postgraduate Scholarship, Hong Kong, 2009–2013.
- [20] AMD Technical Forum and Exhibition (AMD-TFE) **Best Project Award (second place)** for the project “A Formal Analysis of Crosstalk Noise in Mesh-Based Optical Networks-on-Chip for Chip Multiprocessors,” Taipei, Taiwan, 2010.
- [21] AMD Travel Grant, Taiwan, 2010.
- [22] Azad University Scholarship for Outstanding Undergraduate Students, Iran, 2006–2009.

#### 1.4 Professional Appointments

July 2023–present

Associate Professor, Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO, USA

Oct. 2022–present

Rockwell-Anderson Endowed Professor, Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO, USA

Jan. 2021–present

Graduate Faculty, Department of Electrical and Computer Engineering, Duke University, Durham, NC, USA

Sep. 2017–June 2023

Assistant Professor, Department of Electrical and Computer Engineering, Colorado State University, Fort Collins, CO, USA

Sep. 2014–Aug. 2017

Postdoctoral Fellow, Electrical and Computer Engineering Department, McGill University, Montreal, QC, Canada

Sep. 2014–Aug. 2017

Postdoctoral Fellow, Computer and Software Engineering Department, Polytechnique Montreal, Montreal, QC, Canada

Feb. 2014–Aug. 2014

Visiting Scholar, Electronic and Computer Engineering Department, Hong Kong University of Science and Technology, Hong Kong

Sep. 2009–Jan. 2014

Graduate Research Assistant, Electronic and Computer Engineering Department, Hong Kong University of Science and Technology, Hong Kong

## **1.5 Professional Society Membership**

2019–present

IEEE Senior Member

2014–2019

IEEE Member

2015–present

ACM Member

2010–2014

IEEE Graduate Student Member

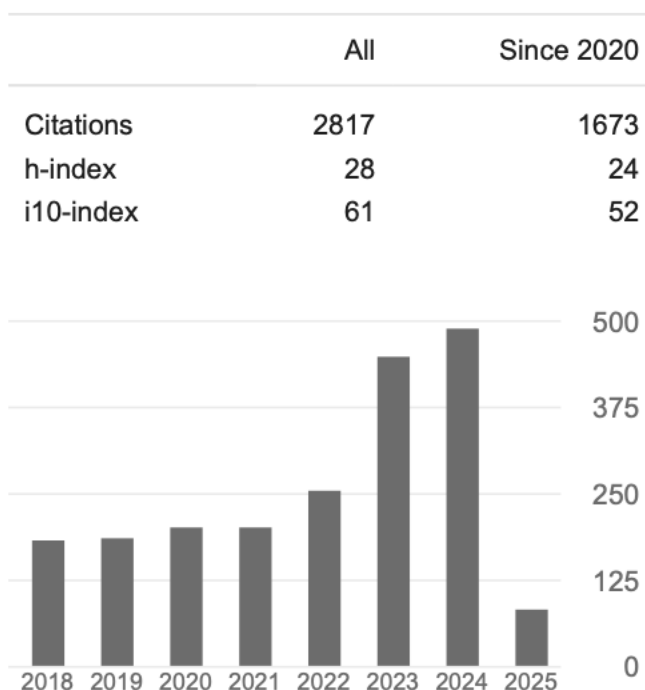
## 2 Research Activities

### 2.1 Research Interest Statement

My primary research goals are focused on design methodologies and development of high-performance computing, data communication, and sensor systems employing emerging technologies while emphasizing energy-efficiency and robustness. Some topics of interest are: High-Performance Computing and Supercomputing Systems, Silicon Photonics, Optoelectronic Systems, Electronic-Photonic Design Automation (EPDA), Electronic-Photonic Systems-on-Chip, Artificial-Intelligence (AI) Hardware Accelerators, Near-Sensor Computing, Optical Switching, Heterogeneous Embedded and Computing Systems, Interconnection Networks, System Modeling and Simulation, Design for Reliability and Energy Efficiency, and Test and Verification.

### 2.2 Publication Citations

(Google Scholar as of March 2025)



### 2.3 Research Grants and Contracts

- [RG1] National Science Foundation (NSF), Division of Computer and Network Systems (CNS), Networking Technology and Systems (NetS), **Principal Investigator:** *CAREER: Optimizing Scalability and Reconfigurability in Silicon Photonic Switch Fabrics*, May 2021 to April 2026. (NSF CNS-2046226)
- [RG2] National Science Foundation (NSF), Division of Computer and Network Systems (CNS), Computer Systems Research (CSR), **Principal Investigator:** *NSF Student Participation Grant for 2020 IEEE International Conference on Green and Sustainable Computing (IEEE IGSC)*, Oct. 2020 to Sep. 2021. (NSF CNS-2040186)

- [RG3] National Science Foundation (NSF), Division of Computing and Communication Foundations (CCF), Foundations of Emerging Technologies (FET), **Principal Investigator** (co-PIs: Edwin Chong and Sudeep Pasricha): *Design Optimization of Silicon Photonic Integrated Circuits under Fabrication-Process Variations*, June 2020 to May 2023. (NSF CCF-2006788)
- [RG4] National Science Foundation (NSF), Division of Computer and Network Systems (CNS), Computer Systems Research (CSR), **Principal Investigator**: *NSF Student Travel Grant for 2019 IEEE International Conference on Green and Sustainable Computing (IEEE IGSC)*, Oct. 2019 to Sep. 2020. (NSF CNS-1939004)
- [RG5] National Science Foundation (NSF), Division of Computing and Communication Foundations (CCF), Software and Hardware Foundations (SHF), **Co-Principal Investigator** (PI: Sudeep Pasricha): *Energy-Efficient and Reliable Communication with Silicon Photonics for Terascale Datacenters-on-Chip*, Oct. 2018 to Sep. 2022. (NSF CCF-1813370)
- [RG6] Engineering Student Technology Committee (ESTC), Colorado State University, **Principal Investigator**: *Automated Probe Station to Train Students for Testing Silicon Photonics Chips*, April 2018.
- [RG7] Colorado State University Faculty Startup, **Principal Investigator**: *High-Performance Computing Systems Employing Silicon Photonics*, Sep. 2017 to Sep. 2021.

## 2.4 Equipment Grants

- [EG1] Hewlett Packard Enterprise (HPE) Equipment Grant, **Principal Investigator**: *Optical Testing and Characterization*, March 2023.
- [EG2] Imec's BioPIX300 Multi-project Wafer (MPW) Fabrication, **Principal Investigator**: *Design and Fabrication of Fault-Tolerant Microring Resonators on Silicon Nitride Platform*, Oct. 2021, €23,000. (Awarded based on merit review and proposal submission)
- [EG3] NVIDIA GPU Grant Program, **Principal Investigator**: *High-End GPU for Eye of Horus (EoH): A Real-Time Automated Surveillance System to Protect Citizens*, Feb. 2019. (Awarded based on merit review and proposal submission)

## 2.5 Other Grants and Contracts

- [1] Hewlett Packard Enterprise (HPE), Mentor Graphics (Siemens Business), and Lumerical Inc. (sponsorship), **Principal Investigator**: *Workshop on Silicon Photonics for High Performance Computing*, Feb. 2019 to May 2019.
- [2] Mentor Graphics (Siemens Business) and CSU Walter Scott Junior College of Engineering (sponsorship), **Principal Investigator**: *Workshop on Silicon Photonics for High Performance Computing*, April 2018 to May 2018.

## 2.6 Research and Development Tools

- [RD1] ProVAT: Process Variation Analysis Tool for Silicon Photonics. *Under development at Colorado State University*. 2018–present.
- [RD2] CLAP: Crosstalk and Loss Analysis Platform for Optical Interconnects. *Released and developed at the Hong Kong University of Science and Technology*. 2009–2014.

- [RD3] OTEMP: Optical Thermal Effect Modeling Platform for Optical Interconnects (Contributed). *Released and developed at the Hong Kong University of Science and Technology*. 2009–2014.
- [RD4] MCSL: A Realistic Traffic Benchmark Suite for Network-on-Chip Studies (Contributed). *Released and developed at the Hong Kong University of Science and Technology*. 2009–2014.

## 2.7 Books

- [B1] **M. Nikdast**, G. Nicolescu, S. Pasricha, A. Seyedi, and D. Liang (Editors), *Silicon Photonics for High-Performance Computing and Beyond*. Taylor and Francis Catalogue (CRC Press), November 2021, ISBN 9780367262143, 408 pp.
- [B2] **M. Nikdast**, G. Nicolescu, S. Le Beux, and J. Xu (Editors), *Photonic Interconnects for Computing Systems: Understanding and Pushing Design Challenges*. River Publishers, Wharton, TX, May 2017, ISBN 9788793519800, 412 pp.

## 2.8 Book Chapters

- [BC1] F. Sunny, A. Mirza, I. Thakkar, **M. Nikdast**, S. Pasricha, “Photonic NoCs for Energy-Efficient Data-Centric Computing,” *in press, Embedded Machine Learning for Cyber-Physical, IoT, and Edge Computing*, Springer Nature, 2023.
- [BC2] F. Sunny, A. Mirza, **M. Nikdast**, S. Pasricha, “Light Speed Machine Learning Inference on the Edge,” *in press, Embedded Machine Learning for Cyber-Physical, IoT, and Edge Computing*, Springer Nature, 2023.
- [BC3] F. Sunny, **M. Nikdast**, S. Pasricha, “Design of Sparsity Optimized Photonic Deep Learning Accelerators,” *in press, Embedded Machine Learning for Cyber-Physical, IoT, and Edge Computing*, Springer Nature, 2023.
- [BC4] F. Sunny, A. Mirza, **M. Nikdast**, S. Pasricha, “Co-designing Photonic Accelerators for Machine Learning on the Edge,” *in press, Embedded Machine Learning for Cyber-Physical, IoT, and Edge Computing*, Springer Nature, 2023.
- [BC5] A. Shafiee, S. Pasricha, and **M. Nikdast**, “Silicon Photonics for Future Computing Systems,” *Wiley Encyclopedia of Electrical and Electronics Engineering*, ISBN 9780471346081, 2022.
- [BC6] **M. Nikdast**, S. Pasricha, G. Nicolescu, A. Seyedi, and D. Liang, “Editor’s Introduction: Silicon Photonics for High-Performance Computing and Beyond,” *Silicon Photonics for High-Performance Computing and Beyond*. Taylor and Francis Catalogue (CRC Press), November 2021, ISBN 9780367262143, pp. 9–15.
- [BC7] F. Sunny, A. Mirza, I. Thakkar, S. Pasricha, and **M. Nikdast**, “Improving Energy Efficiency in Silicon Photonic Networks-on-Chip with Approximation Techniques,” *Silicon Photonics for High-Performance Computing and Beyond*. Taylor and Francis Catalogue (CRC Press), November 2021, ISBN 9780367262143, Chapter 8, pp. 127–141.
- [BC8] F. Sunny, A. Mirza, S. Pasricha, and **M. Nikdast**, “High Performance Deep Learning Acceleration with Silicon Photonics,” *Silicon Photonics for High-Performance Computing and Beyond*. Taylor and Francis Catalogue (CRC Press), November 2021, ISBN 9780367262143, Chapter 19, pp. 367–382.



- [BC9] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “Impact of Fabrication Non-uniformity on Silicon Photonics Networks-on-Chip,” *Photonic Interconnects for Computing Systems: Understanding and Pushing Design Challenges*. River Publishers, Wharton, TX, May 2017, ISBN 9788793519800, Chapter 12, pp. 355–385.
- [BC10] F. Gohring, **M. Nikdast**, F. Hessel, O. Liboiron-Ladouceur, and G. Nicolescu, “Optical Interconnection Networks: The Need for Low-Latency Controllers,” *Photonic Interconnects for Computing Systems: Understanding and Pushing Design Challenges*. River Publishers, Wharton, TX, May 2017, ISBN 9788793519800, Chapter 3, pp. 73–107.
- [BC11] **M. Nikdast**, G. Nicolescu, S. Le Beux, and J. Xu, “Editor’s Introduction: Photonics Interconnects for Computing Systems: Understanding and Pushing Design Challenges,” *Photonic Interconnects for Computing Systems: Understanding and Pushing Design Challenges*. River Publishers, Wharton, TX, May 2017, ISBN 9788793519800, pp. 1–8.

## 2.9 Journal Articles

(Total: 46)

- [J1] D. Najafi, H. Errahmouni Barkam, M. Morsali, S. Jeong, T. Das, A. Roohi, **M. Nikdast**, M. Imani, and S. Angizi, “Neuro-Photonix: Enabling Near-Sensor Neuro-Symbolic AI Computing on Silicon Photonics Substrate,” *IEEE Transactions on Circuits and Systems for Artificial Intelligence (TCA-SAI)*, 2025.
- [J2] A. Shafiee, L. Chen, **M. Nikdast**, and J. Yao, “Polarization-Encodable Photonic Memory Cells Using Next-Generation 2D Phase-Change Materials,” *Nano Research*, 2025.
- [J3] A. Mirza, R. E. Gloekler, S. Pasricha, and **M. Nikdsast**, “ProVAT: An Automated Design and Analysis Framework for Process-Variation-Resilient Design of Silicon Photonic Microring Resonators,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2024.
- [J4] M. A. Mahdian, E. Taheri, K. Rahbardar Mojaver, and **M. Nikdast**, “Hardware Assurance with Silicon Photonic Physical Unclonable Functions,” *Scientific Reports*, 2024.
- [J5] A. Shaiffee, B. Charbonnier, J. Yao, S. Pasricha, and **M. Nikdast**, “Programmable Phase Change Materials and Silicon Photonics Co-integration for Photonic Memory Applications: A Systematic Study,” *Journal of Optical Microsystems (JoM) Letters*, 2024.
- [J6] F. Sunny, A. Shaiffee, A. Balasubramaniam, **M. Nikdast**, and S. Pasricha, “OPIMA: Optical Processing-In-Memory for Convolutional Neural Network Acceleration,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2024.
- [J7] E. Taheri, M. A. Mahdian, S. Pasricha, and **M. Nikdast**, “SwInt: A Non-Blocking Switch-Based Silicon Photonic Interposer Network for 2.5D Machine Learning Accelerators,” *IEEE Journal on Emerging and Selected Topics in Circuits and Systems (JETCAS)*, 2024.
- [J8] E. Taheri, S. Pasricha, and **M. Nikdast**, “ReD: A Reliable and Deadlock-Free Routing for 2.5 D Chiplet-Based Interposer Networks,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, 2024.
- [J9] A. Shafiee, S. Banerjee, K. Chakrabarty, S. Pasricha, and **M. Nikdast**, “Analysis of Optical Loss and Crosstalk Noise in MZI-based Coherent Neural Networks,” *IEEE/Optica Journal of Lightwave Technology (JLT)*, 2024.

- [J10] A. Mirza, R. E. Gloekler, J. Thompson, S. Pasricha, and **M. Nikdast**, “Experimental Analysis of Adiabatic Silicon Photonic Microring Resonators under Process Variations,” *IEEE Photonics Technology Letters (PTL)*, 2024.
- [J11] S. Afifi, F. Sunny, A. Shaiffee, **M. Nikdast**, and S. Pasricha, “GHOST: A Graph Neural Network Accelerator using Silicon Photonics,” *ACM Transactions on Embedded Computing Systems (TECS)*, vol. 22, no. 5s, article no. 102, 2023.
- [J12] E. Taheri, R. G. Kim, and **M. Nikdast**, “AdEle+: An Adaptive Congestion-and-Energy-Aware Elevator Selection for Partially Connected 3D NoCs,” *IEEE Transactions on Computers (TC)*, vol. 72, no. 8, pp. 2278–2292, 2023.
- [J13] A. Shafiee, S. Pasricha, and **M. Nikdast**, “A Survey on Optical Phase-Change Memory: The Promise and Challenges,” *IEEE Access Journal*, vol. 11, pp. 11781–11803, 2023.
- [J14] S. Banerjee, **M. Nikdast**, and K. Chakrabarty, “Characterizing Coherent Integrated Photonic Neural Networks under Imperfections,” *IEEE/Optica Journal of Lightwave Technology (JLT)*, vol. 41, no. 5, pp. 1464–1479, 2023.
- [J15] S. Banerjee, **M. Nikdast**, and K. Chakrabarty, “On the Impact of Uncertainties in Silicon-Photonic Neural Networks,” *IEEE Design and Test (D&T) of Computers*, vol. 40, no. 2, pp. 82–89, 2023.
- [J16] S. Banerjee, **M. Nikdast**, S. Pasricha, and K. Chakrabarty, “Pruning Coherent Integrated Photonic Neural Networks,” *IEEE Photonics Society (IPS) Journal of Selected Topics in Quantum Electronics (JSTQE)*, vol. 29, no. 2: Optical Computing, article no. 6101013, 2023. **(Invited)**
- [J17] A. Mirza, A. Shafiee, S. Banerjee, K. Chakrabarty, S. Pasricha, and **M. Nikdast**, “Characterization and Optimization of Coherent MZI-based Nanophotonic Neural Networks under Fabrication Non-Uniformity,” *IEEE Transactions on Nanotechnology (TNANO)*, vol. 21, pp. 763–771, 2022.
- [J18] A. Mirza, F. Sunny, P. Walsh, K. Hassan, S. Pasricha, and **M. Nikdast**, “Silicon Photonic Microring Resonators: A Comprehensive Design-Space Exploration and Optimization under Fabrication-Process Variations,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 41, no. 10, pp. 3359–3372, 2022.
- [J19] V. S. P. Karempudi, F. Sunny, I. Thakkar, S. V. R. Chittamuru, **M. Nikdast**, and S. Pasricha, “Photonic Networks-on-Chip Employing Multilevel Signaling: A Cross-Layer Comparative Study,” *ACM Journal of Emerging Topics in Computing (JETC)*, vol. 18, no. 3, article no. 45, July 2022.
- [J20] F. Sunny, A. Mirza, **M. Nikdast**, and S. Pasricha, “ROBIN: A Robust Optical Binary Neural Network Accelerator,” *ACM Transactions on Embedded Computing Systems (TECS)*, vol. 20, no. 5s, article no. 57, pp. 1–24, October 2021.
- [J21] F. Sunny, E. Taheri, **M. Nikdast**, and S. Pasricha, “A Survey on Silicon Photonics for Deep Learning,” *ACM Journal of Emerging Topics in Computing (JETC)*, vol. 17, no. 4, article no. 61, pp. 1–57, July 2021.
- [J22] F. Sunny, A. Mirza, I. Thakkar, **M. Nikdast**, and S. Pasricha, “ARXON: A Framework for Approximate Communication over Photonic Networks-on-Chip,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 29, no. 6, pp. 1206–1219, June 2021.
- [J23] S. Pasricha and **M. Nikdast**, “A Survey of Silicon Photonics for Energy Efficient Manycore Computing,” *IEEE Design and Test of Computers (D&T)*, vol. 37, no. 4, pp. 60–81, 2020.

- [J24] M. Bahadori, **M. Nikdast**, Q. Cheng, and K. Bergman, “Universal Design of Waveguide Bends in Silicon-on-Insulator Photonics Platform,” *IEEE Journal of Lightwave Technology (JLT)*, vol. 37, no. 13, pp. 3044–3054, 2019.
- [J25] M. Bahadori, **M. Nikdast**, S. Rumley, L. Y. Dai, N. Janosik, T. V. Vaerenbergh, A. Gazman, Q. Cheng, R. Polster, and K. Bergman, “Design Space Exploration of Microring Resonators in Silicon Photonic Interconnects: Impact of the Ring Curvature,” *IEEE Journal of Lightwave Technology (JLT)*, vol. 36, no. 23, pp. 2767–2782, July 2018.
- [J26] R. Ayari, **M. Nikdast**, I. Hafnaoui, G. Beltrame, and G. Nicolescu, “HypAp: A Hypervolume-based Approach for Refining the Design of Embedded Systems,” *IEEE Embedded Systems Letters (ESL)*, vol. 9, no. 3, pp. 57–60, September 2017.
- [J27] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “Chip-Scale Silicon Photonic Interconnects: A Formal Study on Fabrication Non-Uniformity,” *IEEE Journal of Lightwave Technology (JLT)*, vol. 32, no. 16, pp. 3682–3695, August 2016.
- [J28] L. H. K. Duong, Z. Wang, **M. Nikdast**, J. Xu, P. Yang, Zh. Wang, R. Maeda, H. Li, X. Wang, S. Le Beux, and Y. Thonnart, “Coherent and Incoherent Crosstalk Noise Analyses in Inter/Intra-chip Optical Interconnection Networks,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 24, no. 7, pp. 2475–2487, July 2016.
- [J29] F. Gohring, R. Priti, **M. Nikdast**, F. Hessel, O. Liboiron-Ladouceur, and G. Nicolescu, “Design and Modelling of a Low-Latency Centralized Controller for Optical Integrated Networks,” *IEEE Communications Letters (CL)*, vol. 20, no. 3, pp. 462–465, March 2016.
- [J30] **M. Nikdast**, J. Xu, X. Wu, X. Wang, Z. Wang, Zh. Wang, and P. Yang, “Crosstalk Noise in WDM-based Optical Networks-on-Chip: A Formal Study and Comparison,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 23, no. 11, pp. 2552–2565, November 2015.
- [J31] X. Wu, J. Xu, Y. Ye, X. Wang, **M. Nikdast**, Z. Wang, and Zh. Wang, “An Inter/Intra-chip Optical Network for Manycore Processors,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 23, no. 4, pp. 678–691, April 2015.
- [J32] X. Wang, J. Xu, W. Zhang, X. Wu, Y. Ye, Z. Wang, **M. Nikdast**, and Zh. Wang, “Actively Alleviate Power-Gating-Induced Power/Ground Noise Using Parasitic Capacitance of On-Chip Memories in MPSoCs,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 23, no. 2, pp. 266–279, February 2015.
- [J33] **M. Nikdast**, J. Xu, L. H. K. Duong, X. Wu, Z. Wang, X. Wang, and Zh. Wang, “Fat-Tree-Based Optical Interconnection Networks Under Crosstalk Noise Constraint,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 23, no. 1, pp. 156–169, January 2015.
- [J34] Y. Ye, Z. Wang, J. Xu, X. Wu, X. Wang, **M. Nikdast**, Zh. Wang, and L. H. K. Duong, “System-Level Modeling and Analysis of Thermal Effects in WDM-Based Optical Networks-on-Chip,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 33, no. 11, pp. 1718–1731, November 2014.
- [J35] L. H. K. Duong, **M. Nikdast**, S. Le Beux, J. Xu, X. Wu, Z. Wang, P. Yang, “A Case Study of Signal-to-Noise Ratio in Ring-Based Optical Networks-on-Chip,” *IEEE Design and Test of Computers (D&T)*, vol. 31, no. 5, pp. 55–65, October 2014.

- [J36] X. Wu, J. Xu, Y. Ye, Z. Wang, **M. Nikdast**, and X. Wang, “SUOR: Sectioned Unidirectional Optical Ring for Chip Multiprocessor,” *ACM Journal on Emerging Technologies in Computing Systems (JETC)*, vol. 10, no. 4, pp. 29:1–29:25, May 2014.
- [J37] Z. Wang, J. Xu, X. Wu, Y. Ye, W. Zhang, **M. Nikdast**, X. Wang, and Zh. Wang, “Floorplan Optimization of Fat-Tree Based Networks-on-Chip for Chip Multiprocessors,” *IEEE Transactions on Computers (TC)*, vol. 63, no. 6, pp. 1446–1459, June 2014.
- [J38] X. Wu, Y. Ye, J. Xu, W. Zhang, W. Liu, **M. Nikdast**, and X. Wang, “UNION: A Unified Inter/Intra-Chip Optical Network for Chip Multiprocessors,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 22, no. 5, pp. 1082–1095, May 2014.
- [J39] **M. Nikdast**, J. Xu, X. Wu, W. Zhang, Y. Ye, X. Wang, Z. Wang, and Zh. Wang, “Systematic Analysis of Crosstalk Noise in Folded-Torus-Based Optical Networks-on-Chip,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 33, no. 3, pp. 437–450, March 2014.
- [J40] W. Liu, X. Wang, J. Xu, W. Zhang, Y. Ye, X. Wu, **M. Nikdast**, and Z. Wang, “On-Chip Sensor Networks for Soft-Error Tolerant Real-Time Multiprocessor Systems-on-Chip,” *ACM Journal of Emerging Technologies in Computing Systems (JETC)*, vol. 10, no. 2, pp. 15:1–15:20, March 2014.
- [J41] Y. Xie, **M. Nikdast**, J. Xu, X. Wu, W. Zhang, Y. Ye, X. Wang, Z. Wang, and W. Liu, “A Formal Worst-Case Analysis of Crosstalk Noise in Mesh-Based Optical Networks-on-Chip,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 21, no. 10, pp. 1823–1836, October 2013.
- [J42] Y. Ye, J. Xu, B. Huang, X. Wu, W. Zhang, X. Wang, **M. Nikdast**, Z. Wang, W. Liu, and Zh. Wang, “3D Mesh-based Optical Network-on-Chip for Multiprocessor System-on-Chip,” *IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*, vol. 32, no. 4, pp. 584–596, April 2013.
- [J43] Y. Ye, J. Xu, X. Wu, W. Zhang, X. Wang, **M. Nikdast**, Z. Wang, and W. Liu, “System-Level Modeling and Analysis of Thermal Effects in Optical Networks-on-Chip,” *IEEE Transactions on Very Large Scale Integration Systems (TVLSI)*, vol. 21, no. 2, pp. 292–305, February 2013.
- [J44] Y. Ye, J. Xu, X. Wu, W. Zhang, W. Liu, and **M. Nikdast**, “A Torus-based Hierarchical Optical-Electronic Network-on-Chip for Multiprocessor System-on-Chip,” *ACM Journal on Emerging Technologies in Computing Systems (JETC)*, vol. 8, no. 1, pp. 5:1–5:26, February 2012.
- [J45] S. Nasrolahi, **M. Nikdast**, and M. Mahdavi, “The Semantic Web: A New Approach for Future World Wide Web,” *International Journal of Computer, Electrical, Automation, Control and Information Engineering*, vol. 3, no. 10, pp. 2474–2479, October 2009.
- [J46] A. M. Shafiee, M. Montazeri, and **M. Nikdast**, “An Innovational Intermittent Routing Algorithm in Network-on-Chip,” *International Journal of Computer and Information Engineering*, vol. 2, no. 9, pp. 2907–2909, September 2008.

## 2.10 Conference Proceedings and Presentations

(Total: 88)

Acceptance rate: 20–30%

- [C1] A. Shafiee, F. Sunny, S. Pasricha, and **M. Nikdast**, “LuxNAS: A Coherent Photonic Neural Network Powered by Neural Architecture Search,” in *Proc. IEEE/Optica Conference on Lasers and Electro-Optics (CLEO)*, Long Beach, CA, May 2025.
- [C2] A. Shafiee, L. Chen, S. Pasricha, J. Yao, and **M. Nikdast**, “Enabling Scalable Photonic Tensor Cores with Polarization-Domain Photonic Computing,” in *Proc. IEEE/Optica Optical Fiber Communication (OFC) Conference*, San Francisco, CA, March 2025.
- [C3] Z. Ghanaatian, A. Mirza, A. Shafiee, S. Pasricha, and **M. Nikdast**, “Bridging EDA and Silicon Photonics Design: Enabling Robust-by-Design Photonic Integrated Circuits,” in *Proc. IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, Tokyo, Japan, January 2025. **(Invited)**
- [C4] E. Taheri, and K. Rahbardar Mojaver, and **M. Nikdast**, “Enabling Secure Optical Communication with Silicon-Photonic-Based Physical Unclonable Functions (PUFs),” in *Proc. Government Microcircuit Applications and Critical Technology Conference (GOMACTech)*, Pasadena, CA, March 2025.
- [C5] K. Mienta, B. Ray, and **M. Nikdast**, “Radiation-Hardened Silicon Photonic Integrated Circuits for Space Applications,” in *Proc. Government Microcircuit Applications and Critical Technology Conference (GOMACTech)*, Pasadena, CA, March 2025.
- [C6] M. Morsali, D. Najafi, S. Angizi, and **M. Nikdast**, “Boosting Near-Sensor Visual Processing with Silicon-Photonics-Enabled Edge Intelligence,” in *Proc. Government Microcircuit Applications and Critical Technology Conference (GOMACTech)*, Pasadena, CA, March 2025.
- [C7] Z. Ghanaatian, A. Shafiee, and **M. Nikdast**, “Enhanced Silicon Photonic Switch Fabrics with Variation-Aware Optimized Mach–Zehnder Interferometers,” in *Proc. SPIE Photonics West*, San Francisco, CA, January 2025.
- [C8] A. Shafiee, Z. Ghanaatian, B. Charbonnier, C. A. Ríos Ocampo, S. Pasricha, and **M. Nikdast**, “PCM-based Silicon Photonic Neural Networks under Fabrication Nonuniformity,” in *Proc. SPIE Photonics West*, San Francisco, CA, January 2025.
- [C9] L. Tunesi, M. A. Mahdian, A. Carena, V. Curri, **M. Nikdast**, and P. Bardella, “Programmable Non-Volatile Spectral Shaping in PCM-Enhanced Grating-Assisted Couplers,” in *Proc. SPIE Photonics West*, San Francisco, CA, January 2025.
- [C10] S. Afifi, F. Sunny, S. Pasricha, and **M. Nikdast**, “Shedding Light on LLMs: Harnessing Photonic Neural Networks for Accelerating LLMs,” in *Proc. IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, Newark, NJ, October 2024.
- [C11] M. A. Mahdian, E. Taheri, S. Pasricha, and **M. Nikdast**, “SiPhAI: A Reconfigurable Silicon Photonic Interposer Network for AI Acceleration,” *IEEE Photonics Conference (IPC)*, Rome, Italy, November 2024.
- [C12] F. Sunny, A. Shafiee, A. Balasubramaniam, **M. Nikdast**, and S. Pasricha, “Silicon Photonic Network-on-Interposer Design for Energy Efficient Convolutional Neural Network Acceleration on 2.5D Chiplet Platforms,” *IEEE/ACM International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS)–ESWEEK*, Raleigh, NC, October 2024.

- [C13] L. Tunesi, M. A. Mahdian, A. Shafiee, V. Curri, A. Carena, P. Bardella, and **M. Nikdast**, “Unlocking Versatile and Non-Volatile Bandwidth Tunability in Silicon Photonic Contra-Directional-Coupler-Based Filter Devices,” *IEEE/Optica European Conference on Optical Communications (ECOC)*, Frankfurt, Germany, September 2024.
- [C14] **M. Nikdast**, “Empowering Image Sensors with Integrated Photonic Neural Networks”, *IEEE Photonics is Switching and Computing (PSC) Conference, IEEE Photonic Photonics Society Summer Topical Meetings*, Bridgetown, Barbados, July 2024.
- [C15] F. Gohring, A. Shafiee, G. Nicolescu, and **M. Nikdast**, “Are Photonic Integrated Circuits (PICs) Secure? A Glance at Security Vulnerabilities in PICs”, *IEEE Photonics is Switching and Computing (PSC) Conference, IEEE Photonic Photonics Society Summer Topical Meetings*, Bridgetown, Barbados, July 2024.
- [C16] Z. Ghanaatian, A. Shafiee, and **M. Nikdast**, “Mastering Silicon Photonics Device Design for Scalable and Robust Optical Neural Networks,” *Optica Advanced Photonics Congress*, Quebec City, QC, Canada, July–August, 2024.
- [C17] E. Taheri, P. Aghanoury, S. Pasricha, **M. Nikdast**, and N. Sehatbakhsh, “SCRIPT: A Multiobjective Routing Framework for Securing Chiplet Systems Against DoS Attacks,” *to appear, ACM Great Lakes Symposium on VLSI (GLSVLSI)*, Tampa Bay, FL, June 2024.
- [C18] M. Morsali, B. Reidy, D. Najafi, S. Tabrizchi, M. Imani, **M. Nikdast**, A. Roohi, R. Zand, and S. Angizi, “Lightator: An Optical Near-Sensor Accelerator with Compressive Acquisition Enabling Versatile Image Processing,” *to appear, in Proc. IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, June 2024.
- [C19] F. Sunny, E. Taheri, **M. Nikdast**, and S. Pasricha, “Silicon Photonic 2.5D Interposer Networks for Overcoming Communication Bottlenecks in Scale-out Machine Learning Hardware Accelerators”, *IEEE VLSI Test Symposium (VTS)*, Tempe, AZ, April 2024.
- [C20] M. A. Mahdian, E. Taheri, K. Rahbardar Mojaver, and **M. Nikdast**, “Photonic Physically Unclonable Functions using Ring-Assisted Contra-Directional Couplers,” *in Proc. IEEE/Optica Optical Fiber Communication (OFC) Conference*, San Diego, CA, March 2024.
- [C21] S. Afifi, F. Sunny, **M. Nikdast**, S. Pasricha, “Accelerating Neural Networks for Large Language Models and Graph Processing with Silicon Photonics”, *to appear, in Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Valencia, Spain, March 2024.
- [C22] F. Sunny, A. Shaifee, B. Charbonnier, **M. Nikdast**, and S. Pasricha, “COMET: A Cross-Layer Optimized Optical Phase Change Main Memory Architecture,” *to appear, in Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Valencia, Spain, March 2024.
- [C23] M. Morsali, S. Tabrizchi, D. Najafi, M. Imani, **M. Nikdast**, A. Roohi, and S. Angizi, “OISA: Architecting an Optical In-Sensor Accelerator for Efficient Visual Computing,” *to appear, in Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Valencia, Spain, March 2024.
- [C24] L. Tunesi, M. A. Mahdian, V. Curri, A. Carena, **M. Nikdast**, and P. Bardella, “Segmented Design and Control in Contra-Directional Couplers for Large Bandwidth Tunability,” *to appear, in Proc. SPIE Photonics West*, San Francisco, CA, January 2024.

- [C25] R. Kabir, R. G. Kim, and **M. Nikdast**, “RISA: Round-Robin Intra-Rack Friendly Scheduling Algorithm for Disaggregated Datacenters,” in *Proc. ACM International Workshop on Resource Disaggregation in High-Performance Computing (RESDIS’23)*, collocated with the International Conference for High Performance Computing, Networking, Storage, and Analysis (SC), Denver, CO, November 2023, pp. 1512–1520.
- [C26] E. Taheri, M. A. Mahdian, S. Pasricha, and **M. Nikdast**, “TRINE: A Tree-Based Silicon Photonic Interposer Network for Energy-Efficient 2.5D Machine Learning Acceleration,” in *Proc. ACM International Workshop on Network on Chip Architectures (NoCArc)*, collocated with Annual IEEE/ACM International Symposium on Microarchitecture (MICRO), Toronto, Canada, October 2023, pp. 15–20.
- [C27] A. Shafiee, S. Banerjee, B. Charbonnier, S. Pasricha, and **M. Nikdast**, “Compact and Low-Loss PCM-based Silicon Photonic MZIs for Photonic Neural Networks,” to appear in *Proc. IEEE Photonics Conference (IPC)*, Orlando, FL, November 2023.
- [C28] Z. Ghanaatian, A. Shafiee, and **M. Nikdast**, “Variation-Aware Layout and Design Optimization of Silicon Photonic Mach–Zehnder Interferometers,” to appear in *Proc. IEEE Photonics Conference (IPC)*, Orlando, FL, November 2023.
- [C29] M. A. Mahdian, L. Tunesi, P. Bardella, and **M. Nikdast**, “Bandwidth-Adaptive Single- and Double-Channel Silicon Photonic Contra-Directional Couplers,” to appear in *Proc. IEEE Photonics Conference (IPC)*, Orlando, FL, November 2023.
- [C30] F. Gohring, **M. Nikdast**, and G. Nicolescu, “SerIOS: Enhancing Hardware Security in Integrated Optoelectronic Systems,” to appear in *Proc. IEEE International Workshop on Rapid System Prototyping (RSP), Embedded Systems Week (ESWEEK) Conference*, Hamburg, Germany, September 2023.
- [C31] M. A. Mahdian, E. Taheri, and **M. Nikdast**, “PARS: A Power-Aware and Reliable Control Plane for Silicon Photonic Switch Fabrics,” to appear in *Proc. IEEE/Optica Photonics in Switching and Computing (PSC) Conference*, Mantova, Italy, September 2023.
- [C32] S. Afifi, F. Sunny, A. Shaifee, **M. Nikdast**, and S. Pasricha, “GHOST: A Graph Neural Network Accelerator using Silicon Photonics,” in *Proc. International Conference On Compilers, Architectures, And Synthesis For Embedded Systems (CASES), Embedded Systems Week (ESWEEK) Conference*, Hamburg, Germany, October 2023.
- [C33] A. Shafiee, B. Charbonnier, S. Pasricha, and **M. Nikdast**, “Multiphysics Simulation Approach for Photonic Devices Integrating Phase Change Materials,” to appear in *Proc. IEEE International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD)*, Turin, Italy, September 2023.
- [C34] L. Tunesi, M. A. Mahdian, V. Curri, A. Carena, **M. Nikdast**, and P. Bardella, “Thermal Control Scheme in Contra-Directional Couplers for Centered Tunable Bandwidths,” to appear in *Proc. IEEE International Conference on Numerical Simulation of Optoelectronic Devices (NUSOD)*, Turin, Italy, September 2023.
- [C35] F. Gohring, **M. Nikdast**, and G. Nicolescu, “Integrated Photonic AI Accelerators under Hardware Security Attacks: Impacts and Countermeasures,” to appear in *Proc. IEEE International Midwest Symposium on Circuits and Systems (MWSCAS)*, Phoenix, AZ, July 2023.

- [C36] F. Sunny, **M. Nikdast**, and S. Pasricha, “Cross-Layer Design for AI Acceleration with Non-Coherent Optical Computing,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI)*, Knoxville, TN, June 2023, pp. 539–544.
- [C37] A. Shafiee, B. Charbonnier, S. Pasricha, and **M. Nikdast**, “Design Space Exploration for PCM-based Photonic Memory,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI)*, Knoxville, TN, June 2023, pp. 533–538.
- [C38] S. Afifi, F. Sunny, **M. Nikdast**, and S. Pasricha, “Transformer Neural Network Acceleration with Non-Coherent Silicon Photonics,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI)*, Knoxville, TN, June 2023, pp. 15–21.
- [C39] F. Sunny, E. Taheri, **M. Nikdast**, and S. Pasricha, “Machine Learning Accelerators in 2.5D Chiplet Platforms with Silicon Photonics,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Antwerp, Belgium, April 2023, pp. 1–6.
- [C40] **M. Nikdast**, S. Pasricha, and K. Chakrabarty, “Silicon Photonic Neural Network Accelerators: Opportunities and Challenges,” in *Proc. IEEE/Optica Conference on Lasers and Electro-Optics (CLEO)*, San Jose, CA, May 2023, paper AM2Q.2. **(Invited)**
- [C41] E. Taheri, S. Pasricha, and **M. Nikdast**, “ReSiPI: A Reconfigurable Silicon-Photonic 2.5D Chiplet Network with PCMs for Energy-Efficient Interposer Communication,” in *Proc. IEEE/ACM International Conference on Computer-Aided Design (ICCAD)*, San Diego, CA, October 2022, article no. 24.
- [C42] S. Banerjee, **M. Nikdast**, S. Pasricha, and K. Chakrabarty, “Pruning Coherent Integrated Photonic Neural Networks Using the Lottery Ticket Hypothesis,” in *Proc. IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Paphos, Cyprus, July 2022, pp. 128–133.
- [C43] F. Sunny, **M. Nikdast**, and S. Pasricha, “RecLight: A Recurrent Neural Network Accelerator with Integrated Silicon Photonics,” in *Proc. IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Paphos, Cyprus, July 2022, pp. 98–103.
- [C44] F. Sunny, **M. Nikdast**, and S. Pasricha, “A Silicon Photonic Accelerator for Convolutional Neural Networks with Heterogeneous Quantization,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI) Conference*, Orange Country, CA, June 2022, pp. 367–371.
- [C45] A. Shafiee, S. Banerjee, K. Chakrabarty, S. Pasricha, and **M. Nikdast**, “LoCI: An Analysis of the Impact of Optical Loss and Crosstalk Noise in Integrated Silicon-Photonic Neural Networks,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI) Conference*, Orange Country, CA, June 2022, pp. 351–355.
- [C46] S. Banerjee, **M. Nikdast**, S. Pasricha, and K. Chakrabarty, “CHAMP: Coherent Hardware-Aware Magnitude Pruning of Integrated Photonic Neural Networks,” in *Proc. IEEE/Optica Optical Fiber Communication (OFC) Conference*, San Diego, CA, March 2022, paper M2G.3.
- [C47] E. Taheri, S. Pasricha, and **M. Nikdast**, “DeFT: A Deadlock-Free and Fault-Tolerant Routing Algorithm for 2.5D Chiplet Systems,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Antwerp, Belgium, March 2022, pp. 1047–1052.
- [C48] F. Sunny, **M. Nikdast**, and S. Pasricha, “SONIC: A Sparse Neural Network Inference Accelerator with Silicon Photonics for Energy-Efficient Deep Learning,” in *Proc. IEEE/ACM Asia and South Pacific Design Automation Conference (ASP-DAC)*, January 2022, pp. 214–219.



- [C49] F. Gohring, **M. Nikdast**, F. Hessel, O. Liboiron-Ladouceur, and G. Nicolescu, “HyCo: A Low-Latency Hybrid Control Plane for Optical Interconnection Networks,” in *Proc. IEEE International Workshop on Rapid System Prototyping (RSP)—collocated with ESWEEK*, October 2021, pp. 50–56.
- [C50] A. Shafiee, A. Mirza, F. Sunny, S. Banerjee, K. Chakrabarty, S. Pasricha, and **M. Nikdast**, “Inexact Silicon Photonics: From Devices to Applications,” in *Proc. Optica Photonics in Switching and Computing (PSC) Conference*, September 2021, paper M3C.2. **(Invited)**
- [C51] F. Sunny, A. Mirza, **M. Nikdast**, and S. Pasricha, “ROBIN: A Robust Optical Binary Neural Network Accelerator,” in *Proc. IEEE/ACM International Conference on Compilers, Architectures, and Synthesis for Embedded Systems (CASES)*, October 2021.
- [C52] S. Banerjee, C. Chen, J. Talukdar, S. C. Hung, A. Chaudhuri, **M. Nikdast**, and K. Chakrabarty, “Towards Functionally Robust AI Accelerators,” in *Proc. IEEE Microelectronics Design and Test Symposium (MDTS)*, Albany, NY, May 2021, pp. 1–6.
- [C53] S. Banerjee, **M. Nikdast**, and K. Chakrabarty, “Optimizing Coherent Integrated Photonic Neural Networks under Random Uncertainties,” in *Proc. IEEE/Optica Optical Fiber Communication (OFC) Conference*, San Francisco, CA, June 2021, paper Th1A.22.
- [C54] E. Taheri, R. Kim, and **M. Nikdast**, “AdEle: An Adaptive Congestion-and-Energy-Aware Elevator Selection for Partially Connected 3D NoCs,” in *Proc. IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, December 2021, pp. 67–72.
- [C55] F. Sunny, A. Mirza, **M. Nikdast**, and S. Pasricha, “CrossLight: A Cross-Layer Optimized Silicon Photonic Neural Network Accelerator,” in *Proc. IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, December 2021, pp. 1069–1074.
- [C56] S. Banerjee, **M. Nikdast**, and K. Chakrabarty, “Modeling Silicon-Photonic Neural Networks under Uncertainties,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Grenoble, France, March 2021, pp. 98–101.
- [C57] A. Mirza, S. Pasricha, and **M. Nikdast**, “Variation-Aware Inter-Device Matching in Silicon Photonic Microring Resonator Demultiplexers,” in *Proc. IEEE Photonics Conference (IPC)*, Vancouver, BC, Canada, September 2020, pp. 1–2.
- [C58] F. Sunny, A. Mirza, I. Thakkar, S. Pasricha, and **M. Nikdast**, “LORAX: Loss-Aware Approximations for Energy-Efficient Silicon Photonic Networks-on-Chip,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI)*, Beijing, China, September 2020, pp. 235–240. **(Best Paper Honorable Mention Award)**
- [C59] A. Mirza, F. Sunny, S. Pasricha, and **M. Nikdast**, “Silicon Photonic Microring Resonators: Design Optimization under Fabrication Non-uniformity,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Grenoble, France, March 2020, pp. 484–489.
- [C60] A. Mirza, S. Manafi Avari, E. Taheri, S. Pasricha, and **M. Nikdast**, “Opportunities for Cross-Layer Design in High-Performance Computing Systems with Integrated Silicon Photonic Networks,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Grenoble, France, March 2020, pp. 1622–1627.
- [C61] T. M. Tseng, A. Truppel, M. Li, **M. Nikdast**, and U. Schlichtmann, “Wavelength-Routed Optical NoCs: Design and EDA — State of the Art and Future Directions,” *Special Session on Breaking*

*the Ice Between Silicon Photonics Design and EDA: Electronic-Photonic Design Automation*, in *Proc. IEEE/ACM International Conference on Computer Aided Design (ICCAD)*, Westminster, CO, November 2019, pp. 1–6.

- [C62] X. Cao, B. Bhatnagar, **M. Nikdast**, and S. Roy, “Hierarchical Polynomial Chaos for Variation Analysis of Silicon Photonics Microresonators,” in *Proc. IEEE Applied Computational Electromagnetics Society (ACES) Symposium*, Miami, FL, April 2019, pp. 1–2.
- [C63] **M. Nikdast**, G. Nicolescu, and O. Liboiron-Ladouceur, “Improving Microresonator Reliability in Silicon Photonic Integrated Circuits,” in *Proc. IEEE Optical Interconnect (OI) Conference*, Santa Fe, NM, May 2018, pp. 3–4.
- [C64] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “DeEPeR: Enhancing Performance and Reliability in Optical Interconnection Networks,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI) Conference*, Chicago, IL, May 2018, pp. 63–68. **(Best Paper Award Finalist)**
- [C65] F. Gohring, **M. Nikdast**, Y. Xiong, F. Hessel, O. Liboiron-Ladouceur, and G. Nicolescu, “Silicon Photonic Interconnects: Minimizing the Controller Latency,” in *Proc. ACM Great Lakes Symposium on VLSI (GLSVLSI) Conference*, Chicago, IL, May 2018, pp. 323–328. **(Invited)**
- [C66] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “Enabling Efficient Tolerance Analysis in Silicon Photonic Integrated Circuits,” in *Proc. IEEE Progress in Electromagnetic Research Symposium (PIERS)*, Shanghai, China, August 2016, pp. 783–783. **(Invited)**
- [C67] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “An Analytical Study of Process Variations in Silicon Photonic Integrated Circuits,” in *Proc. IEEE Photonics North (PN)*, Quebec City, Canada, May 2016, pp. 1–2. **(Invited)**
- [C68] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “Modeling Fabrication Non-Uniformity in Chip-Scale Silicon Photonic Interconnects,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Dresden, Germany, March 2016, pp. 115–120. **(Best Paper Award, Test Track)**
- [C69] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “Photonic Integrated Circuits: A Study on Process Variations,” in *Proc. IEEE/Optica Optical Fiber Communications Conference and Exhibition (OFC)*, Anaheim, CA, March 2016, paper W2A.22.
- [C70] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-ladouceur, “Silicon Photonic Integrated Circuits under Process Variations,” in *Proc. IEEE/Optica Asia Communications and Photonics Conference*, Hong Kong, November 2015, paper ASu2A.12. **(Best Paper Award)**
- [C71] F. Gohring, R. Priti, **M. Nikdast**, F. Hessel, O. Liboiron-Ladouceur, and G. Nicolescu, “A Low-Latency Centralized Controller for MZI-Based Optical Integrated Networks,” in *Proc. IEEE International Conference on Photonics in Switching (PS)*, Florence, Italy, September 2015, pp. 118–120.
- [C72] L. H. K. Duong, **M. Nikdast**, J. Xu, Z. Wang, Y. Thonnart, S. Le Beux, P. Yang, X. Wu, and Zh. Wang, “Coherent Crosstalk Noise Analyses in Ring-Based Optical Interconnects,” in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Grenoble, France, March 2015, pp. 501–506.
- [C73] **M. Nikdast**, L. H. K. Duong, J. Xu, S. Le Beux, X. Wu, Z. Wang, P. Yang, and Y. Ye, “CLAP: A Crosstalk and Loss Analysis Platform for Optical Interconnects,” in *Proc. IEEE/ACM International Symposium on Networks-on-Chip (NoCS)*, Ferrara, Italy, September 2014, pp. 172–173.

- [C74] Y. Ye, X. Wu, J. Xu, **M. Nikdast**, Z. Wang, and X. Wang, "System-Level Analysis of Mesh-Based Hybrid Optical-Electronic Network-on-Chip," in *Proc. IEEE International Symposium on Circuits and Systems (ISCAS)*, Beijing, China, May 2013, pp. 321–324. **(Invited)**
- [C75] X. Wang, J. Xu, W. Zhang, X. Wu, Y. Ye, Z. Wang, **M. Nikdast**, and Zh. Wang, "Active Power-Gating-Induced Power/Ground Noise Alleviation Using Parasitic Capacitance of On-Chip Memories," in *Proc. IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Grenoble, France, March 2013, pp. 1221–1224.
- [C76] W. Liu, Z. Wang, X. Wu, J. Xu, B. Li, W. Zhang, Y. Ye, Z. Wang, and **M. Nikdast**, "A Network-on-Chip Benchmark Suite Based on Real Applications," in *Proc. Workshop on SoCs, Heterogeneous Architectures and Workloads (SHAW) - In Conjunction with IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, Shenzhen, China, February 2013. **(Invited)**
- [C77] Y. Ye, X. Wu, J. Xu, W. Zhang, **M. Nikdast**, and X. Wang, "Holistic Comparison of Optical Routers for Chip Multiprocessors," in *Proc. IEEE Anti-counterfeiting, Security, and Identification (ASIC)*, Taipei, Taiwan, November 2012, pp. 1–5.
- [C78] Y. Ye, J. Xu, X. Wu, W. Zhang, W. Liu, **M. Nikdast**, X. Wang, Z. Wang, and Zh. Wang, "Thermal Analysis for 3D Optical Network-on-Chip Based on a Novel Low-Cost 6×6 Optical Router," in *Proc. IEEE Optical Interconnects Conference (OI)*, Santa Fe, NM, May 2012, pp. 110–111.
- [C79] Z. Wang, J. Xu, X. Wu, Y. Ye, W. Zhang, W. Liu, **M. Nikdast**, X. Wang, and Zh. Wang, "A Novel Low-Waveguide-Crossing Floorplan for Fat Tree Based Optical Networks-on-Chip," in *Proc. IEEE Optical Interconnects Conference (OI)*, Santa Fe, NM, May 2012, pp. 100–101.
- [C80] Y. Ye, J. Xu, X. Wu, W. Zhang, X. Wang, **M. Nikdast**, Z. Wang, and W. Liu, "Modeling and Analysis of Thermal Effects in Optical Networks-on-Chip," in *Proc. IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Chennai, India, July 2011, pp. 254–259.
- [C81] W. Liu, J. Xu, X. Wu, Y. Ye, X. Wang, W. Zhang, **M. Nikdast**, Z. Wang, "A NoC Traffic Suite Based on Real Applications," in *Proc. IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Chennai, India, July 2011, pp. 66–71.
- [C82] W. Liu, J. Xu, X. Wang, Y. Wang, W. Zhang, Y. Ye, X. Wu, **M. Nikdast**, and Z. Wang, "A Hardware-Software Collaborated Method for Soft-Error Tolerant MPSoC," in *Proc. IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*, Chennai, India, July 2011, pp. 260–265.
- [C83] Y. Xie, **M. Nikdast**, J. Xu, W. Zhang, Q. Li, X. Wu, Y. Ye, W. Liu, and X. Wang, "Crosstalk Noise and Bit Error Rate Analysis for Optical Network-on-Chip," in *Proc. IEEE/ACM Design Automation Conference (DAC)*, Anaheim, CA, June 2010, pp. 657–660.
- [C84] X. Wu, Y. Ye, W. Zhang, W. Liu, **M. Nikdast**, X. Wang, and J. Xu, "UNION: A Unified Inter/Intra-Chip Optical Network for Chip Multiprocessors," in *Proc. IEEE/ACM International Symposium on Nanoscale Architectures (NanoArch)*, Anaheim, CA, July 2010, pp. 35–40. **(Invited)**
- [C85] H. Ahmadi and **M. Nikdast**, "Age-Based Adaptive Routing Algorithm for Network-on-Chip," in *Proc. Iranian Student Conference in Electrical Engineering (ISCEE)*, Tabriz, Iran, May 2009.
- [C86] M. Davarpanah, A. Mohamad Shafiee, **M. Nikdast**, and M. Montazeri, "A Predetermined Routing Algorithm for Network-on-Chip," in *Proc. Iranian Conference on Electrical Engineering (ICEE)*, Tehran, Iran, May 2009.

- [C87] A. M. Shafiee, **M. Nikdast**, and M. Montazeri, “Parameterized Intermittent Routing Algorithm in Networks-on-Chip,” in *Proc. IEEE International Conference on Emerging Trends in Computing (ICETiC)*, India, 2009.
- [C88] B. Soleimani, E. Shahabian, M. Yavari, and **M. Nikdast**, “A Novel Heuristic for Solving the 8 Puzzle Problem Based on IDA Method,” in *Proc. Iranian Student Conference in Electrical Engineering (ISCEE)*, Zanjan, Iran, 2008.

## 2.11 Guest Editorials

- [GE1] M. Moreto Planas, **M. Nikdast**, “Guest Editors’ Introduction: Special Issue on 16th IEEE/ACM International Symposium on Networks-on-Chip (NOCS),” *IEEE Design and Test of Computers (D&T)*, 2022.
- [GE2] D. Bertozzi, J. L. Abellan, and **M. Nikdast**, “Editorial: Special Issue on Network-on-Chip Again on the Rise: From Emerging Applications to Emerging Technologies,” *Micromachines*, vol. 12, 2021, 1570.
- [GE3] E. Fusella, **M. Nikdast**, I. O’Connor, J. Flich, S. Pasricha, “Guest Editor’s Introduction: Special Issue on Emerging Networks-on-Chip: Designs, Technologies, and Applications,” *ACM Journal on Emerging Technologies in Computing Systems (JETC)*, vol. 15, no. 1, article 1, February 2019.

## 2.12 Other Publications

- [A1] **M. Nikdast** and S. Pasricha, “Scaling Coherent Integrated Photonic Neural Networks for Artificial Intelligence Applications,” *Neuromorphic Photonics Roadmap*, 2024.
- [A2] **M. Nikdast**, “Research Papers: Writing Tips and Top-Tier Targets,” *IEEE Potentials*, vol. 36, no. 3, pp. 26–29, May–June 2017.
- [A3] **M. Nikdast**, “Research Tips for First-Year Ph.D. Students,” *IEEE Potentials*, vol. 35, no. 3, pp. 18–20, May–June 2016.
- [A4] S. Sinha and **M. Nikdast**, “Finding Happiness and Satisfaction During Your Ph.D. Program,” *IEEE Potentials*, vol. 34, no. 3, pp. 36–38, May–June 2015.

## 2.13 Refereed Conference and Workshop Poster Presentations

- [P1] S. Manafi Avari, R. G. Kim, and **M. Nikdast**, “Adaptive Resource Management in Photonically Interconnected Disaggregated Datacenters,” *International Conference on Green and Sustainable Computing (IGSC)*, Alexandria, VA, October 2019.
- [P2] M. Pakhale, Y. Chopra, N. Daley, and **M. Nikdast**, “Eye of Horus (EoH): An Automated Real-Time Surveillance System to Protect Citizens,” *Colorado State University Demo Day Forum*, Fort Collins, CO, April 2019. (**Best Poster People’s Choice Award**)
- [P3] **M. Nikdast**, G. Nicolescu, and O. Liboiron-Ladouceur, “Fault-Tolerant Optical NoCs: An Approach Based on Microresonators Design Space Exploration,” *IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, June 2018. (Late Breaking Results Session)

- [P4] **M. Nikdast**, G. Nicolescu, J. Trajkovic, and O. Liboiron-Ladouceur, “Photonic Integrated Circuits: A Study on Process Variations,” *IEEE/Optica Montreal Networking Event and Poster Competition*, Montreal, Canada, March 2017.
- [P5] **M. Nikdast**, “Silicon Photonic Interconnects: Design Opportunities and Challenges,” *University of Concordia Postdoctoral Research Day*, Montreal, Canada, November 2015.
- [P6] **M. Nikdast**, “Optical Interconnects for Computing Systems: A Formal Study on Signal-to-Noise Ratio,” *IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition*, Grenoble, France, March 2015. (Ph.D. Forum)
- [P7] **M. Nikdast** and J. Xu, “On the Impact of Crosstalk Noise in Optical Networks-on-Chip,” *IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, June 2014. (Ph.D. Forum)
- [P8] Z. Wang, J. Xu, X. Wu, X. Wang, Zh. Wang, **M. Nikdast**, P. Yang, “Holistic Modeling and Comparison of Inter-Chip Optical and Electrical Interconnects,” *IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, June 2014. (Work in Progress Session)
- [P9] W. Liu, J. Xu, X. Wu, Y. Ye, X. W., W. Zhang, **M. Nikdast**, and Z. Wang, “MCSL: A Realistic Traffic Benchmark Suite for Network-on-Chip Studies,” *IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, June 2011. (Work in Progress Session )
- [P10] W. Liu, J. Xu, X. Wang, Y. Wang, W. Zhang, Y. Ye, X. Wu, *M. Nikdast*, and Z. Wang, “A Low-Overhead Hardware-Software Collaborated Approach for Soft-Error Tolerance,” *IEEE/ACM Design Automation Conference (DAC)*, San Diego, CA, June 2011. (Work in Progress Session)
- [P11] **M. Nikdast**, J. Xu, X. Wu, Y. Ye, W. Liu, and X. Wang, “A Formal Analysis of Crosstalk Noise in Mesh-Based Optical Networks-on-Chip for Chip Multiprocessors,” *AMD Technical Forum and Exhibition (AMD-TFE)*, Taipei, Taiwan, October 2010. (**Best Project Award, Second place**)
- [P12] W. Liu, X. Wang, J. Xu, X. Wu, Y. Ye, and **M. Nikdast**, “A Case Study of On-Chip Sensor Networks for Soft-Error Tolerant Multiprocessor Systems-on-Chip,” *AMD Technical Forum and Exhibition (AMD-TFE)*, Taipei, Taiwan, October 2010.
- [P13] **M. Nikdast** and M. Montazeri, “Analysis of Different Routing Algorithms in NoCs,” *Iranian Student Conference in Electrical Engineering (ISCEE)*, Zanjan, Iran, May 2008.

## 2.14 Thesis

- [T1] **M. Nikdast**, “Signal-to-Noise Ratio in Optical Interconnection Networks: Analysis, Modeling, and Comparison,” Ph.D. Dissertation, *The Hong Kong University of Science and Technology (HKUST)*, Hong Kong, December 2013.

## 2.15 Invited Talks, Panels, and Keynotes

- [IT1] IEEE Research and Application of Photonics in Defense (RAPID) Conference, Miramar Beach, FL, August 2025: *Improving Integrated Photonic Yield with a Robust-by-Design Approach*.
- [IT2] Rutgers Efficient AI seminar, Online, December 2024: *Brains on Light: Silicon Photonics for Deep Learning*.

- [IT3] Special Session on Advancing AI: Cross-disciplinary Insights into Next-Gen Tools, Tech and Architectures, IEEE/ACM International Conference on Computer Aided Design (ICCAD), Newark, NJ, October 2024: *Shedding Light on LLMs: Harnessing Photonic Neural Networks for Accelerating LLMs.*
- [IT4] Integrated Photonics Research (IPR) Meeting, Optica Advanced Photonics Congress, Quebec City, QC, Canada, July–August 2024: *Mastering Silicon Photonics Device Design for Scalable and Robust Optical Neural Networks.*
- [IT5] IEEE Photonics Society Summer Topicals Meeting Series, Bridgetown, Barbados, July 2024: *Empowering Image Sensors with Integrated Photonic Neural Networks.*
- [IT6] Workshop on Intelligent Photonic Devices and Systems (sponsored by NSF), University of Utah, Salt Lake City, Utah, May 2024: *Integrated Photonics for Artificial Intelligence: Shedding Light on the Limitations!*
- [IT7] International Workshop on Network-on-Chip Architectures (NoCArc), IEEE/ACM International Symposium on Microarchitecture (MICRO), Toronto, ON, Canada, October 2023: *Keynote: Photonic Systems-on-Chip for Deep Learning.*
- [IT8] IEEE Photonics Conference (IPC), Orlando, FL, November 2023: *Hardware-Software Codesign for Integrated Photonic Neural Networks.*
- [IT9] Intel, Online, June 2023: *The Promise of Integrated Photonics for AI Acceleration and Computing.*
- [IT10] HPE's Tech Talk Series, Online, May 2023: *Cross-Layer Design of Silicon Photonic Neural Network Accelerators.*
- [IT11] IEEE International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSoc), Singapore, December 2023: *Keynote: The Silicon Photonics Marathon: From Optical Interconnect to Computing and Memory!*
- [IT12] IEEE International Forum on Multicore and Multiprocessor SoCs (MPSocS), Fort Collins, Colorado, June 2023: *Integrated Photonics in the AI Era: Promises and Challenges!*
- [IT13] Application and Technology Topical Reviews: Silicon Photonics for Optical I/O, Artificial Intelligence, and High-Performance Computing, IEEE/Optica Conference on Lasers and Electro-Optics (CLEO), San Jose, CA, May 2023: *Silicon Photonic Neural Network Accelerators: Opportunities and Challenges!*
- [IT14] Office of the Vice President for Research (OVPR), Colorado State University, Fort Collins, CO, March 2022: *NSF CAREER Panel.*
- [IT15] ACM/IEEE Design Automation Conference (DAC) Early Faculty Workshop, San Francisco, CA, December 2021: *Funding: When, Where, and How I can fund my Research?*
- [IT16] Optica Photonics in Switching and Computing (PSC) Conference, Virtual Conference, September 2021: *Inexact Silicon Photonics: From Devices to Applications.*
- [IT17] School of Engineering, The Hong Kong University of Science and Technology, Virtual, March 2021: *Pathways to Academia.*
- [IT18] IEEE-Eta Kappa Nu (HKN) Premier Educational and Networking Event, Virtual Panel, November 2020: *Pathways to Academia Panel.*

- [IT19] Silicon Photonic Special Day at IEEE/ACM Design, Automation, and Test in Europe (DATE) Conference and Exhibition, Grenoble, France, March 2020: *Opportunities for Cross-Layer Design in High-Performance Computing Systems with Integrated Silicon Photonic Networks.*
- [IT20] Computer Science Department, Colorado State University, Fort Collins, CO, November 2018: *Computing Systems Integrating Silicon Photonics: An Illusion or a Realistic Solution?*
- [IT21] Workshop on Energy-efficient Networks of Computers: From the Chip to the Cloud at the IEEE International Conference on Green and Sustainable Computing (IGSC), Pittsburgh, PA, October 2018: *Silicon Photonics for High Performance Computing: Opportunities and Challenges!*
- [IT22] Ingram School of Engineering, Texas State University, San Marcos, TX, April 2017: *Multiprocessor Computing Systems Integrating Silicon Photonics Interconnects.*
- [IT23] Computer and Software Engineering Department, Polytechnique Montreal, QC, Canada, March 2017: *Computing Systems Integrating Silicon Photonics: An Illusion or a Realistic Solution?*
- [IT24] Electrical and Computer Engineering Department, Colorado State University, Fort Collins, CO, February 2017: *Multiprocessor Computing Systems Integrating Silicon Photonics Interconnects.*
- [IT25] Electrical and Computer Engineering Department, University of Toronto, ON, Canada, November 2016: *Silicon Photonic Interconnection Networks for Multiprocessor Computing Systems: Let's Meet in the Middle!*
- [IT26] IEEE Progress in Electromagnetics Research Symposium (PIERS) - Special Session on Nanophotonics and Integration, Shanghai, China, August 2016: *Enabling Tolerance Analysis in Silicon Photonics Integrated Circuits.*
- [IT27] IEEE Photonics North Conference, Quebec City, Canada, May 2016: *An Analytical Study of Process Variations in Silicon Photonics Integrated Circuits.*
- [IT28] Computer and Software Engineering Department, Polytechnique Montreal, QC, Canada, April 2016: *Silicon Photonic Interconnect For Computing Systems: Opportunities and Challenges!*
- [IT29] Optical/Photonic Interconnects for Computing Systems (OPTICS) Workshop at the IEEE/ACM Design, Automation, and Test in Europe (DATE) Conference and Exhibition, Dresden, Germany, March 2016: *Fabrication Non-Uniformity in Silicon Photonics Interconnects.*
- [IT30] Special Session on Silicon Photonics Interconnects at the IEEE/ACM International Symposium on Networks-on-Chip (NoCs), Ferrara, Italy, September 2014: *CLAP: A Crosstalk and Loss Analysis Platform for Optical Interconnects.*
- [IT31] Networks-on-Chip Workshop at the Hong Kong University of Science and Technology, Hong Kong, October 2012: *Formal Worst-case Analysis of Crosstalk Noise in Mesh-based Optical Networks-on-Chip.*
- [IT32] AMD Technical Forum and Exhibition, Taipei, Taiwan, October 2010: *A Formal Analysis of Crosstalk Noise in Mesh-Based Optical Networks-on-Chip for Chip Multiprocessors.*
- [IT33] School of Electrical and Computer Engineering, University of Tehran, Tehran, Iran, July 2010: *Bit Error Rate Analysis in Optical Networks-on-Chip.*

### 3 Educational Activities

#### 3.1 Current Ph.D. Students (Advisor)

Richard Chong	Ph.D. (FA2024 – ) Thesis: In progress.
Zahra Ghanaatian	Ph.D. (SP2023 – ) Thesis: In progress.
Mohammad A. Mahdian	Ph.D. (FA2022 – ) Thesis: In progress.
Rashadul Kabir	Ph.D. (FA2021 – ) Thesis: In progress.
Amin Shafiee	Ph.D. (SP2021 – ), Jointly supervised with S. Pasricha Thesis: In progress.

#### 3.2 Current M.Sc. Students (Advisor)

Kevin Mienta	M.Sc. (SP2024 – ) Thesis: <i>Radiation Analysis in Silicon Photonics</i>
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#### 3.3 Current Undergraduate Students

Alexander Benson	B.Sc. (SP2023) CSU Scott Undergraduate Research Experience (SURE) Program Project: <i>Silicon Photonic Automated Testing Station</i> .
Garrett Andreson	B.Sc. (SP2022 – SP2023) Project: <i>Routing Algorithms in 3D On-Chip Networks</i> .

#### 3.4 Ph.D. Students Graduated

Dr. Asif Mirza	Ph.D. (Spring 2018 – Summer 2024), co-advised with S. Pasricha Thesis: <i>Design Exploration and Optimization of Silicon Photonic Integrated Circuits under Fabrication-Process Variations</i> . First Position: Silicon Austria Labs (SAL), Austria.
Dr. Ebadollah Taheri	Ph.D. (Fall 2019 – Spring 2024), co-advised with S. Pasricha Thesis: <i>Design and Optimization of Efficient, Fault-Tolerant and Secure 2.5D Chiplet Systems</i> . First Position: HP Labs, CA, USA.
Dr. Febin Sunny	Ph.D. (Spring 2018 – Spring 2024), co-advised with S. Pasricha Thesis: <i>Hardware-Software Co-Design of Silicon Photonic AI Accelerators</i> . First Position: AMD, TX, USA.



### 3.5 Graduate Thesis Committee Member (Graduated)

- Reshma Sunny MS (October 2022)  
Committee Member  
Thesis: *3D Localization of Cytoskeleton in Mouse Spermatids Using Stochastic Optical Reconstruction Microscopy.*
- Dr. Sanmitra Banerjee Ph.D. (May 2022), Jointly supervised (intellectual co-advisor) with K. Chakrabarty at Duke University  
Thesis: *Modeling and Optimization of Emerging Technology-Based Artificial Intelligence Accelerators under Imperfections.*
- Dr. Meisam Bahadori Ph.D., Columbia University (June 2018)  
External Committee Member  
Thesis: *Physical Layer Modeling and Optimization of Silicon Photonics Interconnection Networks.*

### 3.6 M.Sc. Thesis Students Graduated (Advisor)

- Ahmed Mohammad M.Sc. (FA2022–SP2024), Jointly supervised with K. Lear  
Thesis: *Engineering a Silicon-Photonic Bimodal Biosensor.*
- Sakshi Bhatnagar M.Sc. (FA2017–SP2019), Jointly supervised with S. Roy  
Thesis: *Performance Assessment of Multi-Walled Carbon Nano-Tube Interconnects Using Advanced Polynomial Chaos Scheme.*

### 3.7 M.Sc. Project Students Graduated (Advisor)

- Lekha Rane M.Sc. (FA2019–SUM2021)  
Final Project: *Automated and In-Package Testing of Silicon Photonic Integrated Circuits.*
- Siddhi Sawant M.Sc. (FA2019–SUM2021)  
Final Project: *Analysis of Fabrication-Process Variations in Silicon Photonic Integrated Circuits.*
- Shruti Parab M.Sc. (FA2019–SP2020)  
Final Project: *Silicon Photonic Neural Networks.*
- Aniruddha Vyawahare M.Sc. (SP2018–SP2020)  
Final Project: *Electronic-Photonic Co-Simulation and Co-Design.*
- Mihir Pakhale M.Sc. (SP2018–SUM2019)  
Project: *Developing an Automated Surveillance System Using Machine Learning Solutions for Secured Environments.*

### 3.8 Undergraduate Senior Design Projects Supervised

- FA2023–SP2024 Ali Algedheebi, Gavin Looney, and Ben Morrison  
Project: *Semi-automated photonic testing station for passive and active silicon photonic devices.*

FA2022–SP2023	Ashlen Grote, Mason Higgins, Joshua Laskie, and Qianya Zhu Project (sponsored by Keysight): <i>Digital Signal Processing Using Verilog HDL</i> .
FA2019–SP2020	Aly Ammar, Gi Heyon Hong, and Seungryong Lyu Project: <i>Eye of Horus (EoH): An Automated Real-Time Surveillance System to Protect Citizens</i> .

### 3.9 Undergraduate Research Students Supervised

Garrett Anderson	B.Sc. (SP2022–SP2023) Project: <i>Routing Algorithms in 3D On-Chip Networks</i> .
Alexander Benson	B.Sc. (SP2023) CSU Scott Undergraduate Research Experience (SURE) Program Project: <i>Silicon Photonic Automated Testing Station</i> .
Joseph Thompson	B.Sc. (SP2022) CSU Scott Undergraduate Research Experience (SURE) Program Project: <i>Silicon Photonic Automated Testing Station</i> .
Ryan Gloekler	B.Sc. (SP2021–SUM2022) Project: <i>Design Exploration, Optimization, and Optimization of Silicon Photonic Integrated Circuits</i> .
Peter Walsh	B.Sc. (FA2019–SP2021) Project: <i>Development of Realistic Silicon Photonic Variation Maps</i> . Publications: [J7].
Bronson Wong	B.Sc. (FA2019–SP2021) Project: <i>Real-Time Surveillance with Machine Learning Techniques</i> .
Calvin Tai	B.Sc. (FA2019–SP2020) Project: <i>Real-Time Surveillance with Machine Learning Techniques</i> .
Anderson Worcester	Independent Undergraduate Research Program (SP2020) Project: <i>In-Package Calibration of Silicon Photonic Integrated Circuits</i> .
Zach Burpoe	CSU Scott Undergraduate Research Experience (SURE) Program (SP2020) Project: <i>Automated Testing Probe for Silicon Photonic Integrated Circuits</i> .
Chris Feug	CSU Scott Undergraduate Research Experience (SURE) Program (SP2020) Project: <i>An Automated Real-Time Surveillance System Employing Machine Learning Techniques and Drones</i> .

Nick Daly CSU Scott Undergraduate Research Experience (SURE) Program (SP2019)  
Project: *An Automated Real-Time Surveillance System Employing Machine Learning Techniques and Drones.*

### 3.10 K–12 Student Projects Supervised

Julia Zheng High School Intern Student (SUM2023)  
Joined the Computer Science Department at Duke University  
Project: *Testing Silicon Photonic Devices and Analyzing Data.*

Kate Glover High School Intern Student (SUM2023)  
Project: *Testing Silicon Photonic Devices and Analyzing Data.*

Kacy Larson High School Intern Student (SUM2023)  
Project: *Testing Silicon Photonic Devices and Analyzing Data.*

Noah Mulvaney High School Senior Student Capstone Project (FA2018–SP2019)  
Joined ECE Department at University of Wyoming  
Project: *Remote Sensing for Automated Surveillance Systems.*

### 3.11 Student Awards

Asif Mirza *Design Contest for First-Time Users of imec SiN-Photonics Technology (imec’s BioPIX300 MPW shuttle run), 2021 (worth €23,000)*

Ebad Taheri *NSF-Funded Student Participation Award, IEEE International Green and Sustainable Computing (IGSC) Conference, Virtual, 2021*

Ebad Taheri *NSF-Funded Student Participation Award, IEEE International Green and Sustainable Computing (IGSC) Conference, Virtual, 2020*

Ebad Taheri *A. Richard Newton Young Student Fellowship, IEEE/ACM Design Automation Conference, Virtual, 2020*

Shadi Manafi *NSF-Funded Travel Award, IEEE International Green and Sustainable Computing (IGSC) Conference, Alexandria, VA 2019*

Ebad Taheri *Travel Award, IEEE/ACM International Symposium on Networks-on-Chip (NOCS), New York, NY 2019*

Mihir Pakhale *Best Poster People’s Choice Award, Colorado State University Demo Day, Fort Collins, Co 2019*

Asif Mirza *A. Richard Newton Young Student Fellowship, IEEE/ACM Design Automation Conference, Las Vegas, NV 2019*

Febin Sunny *A. Richard Newton Young Student Fellowship, IEEE/ACM Design Automation Conference, Las Vegas, NV 2019*

Shadi Manafi *A. Richard Newton Young Student Fellowship, IEEE/ACM Design Automation Conference, Las Vegas, NV 2019*

### 3.12 Teaching Experience at CSU

- ECE 102 *Digital Circuit Logic*, Fall 2024
- ECE 544 *Silicon Photonics for Computing Systems*, Fall 2024
- ECE 445 *Digital Logic Synthesis*, Spring 2024
- ECE 102 *Digital Circuit Logic*, Spring 2024
- ECE 544 *Silicon Photonics for Computing Systems*, Fall 2023
- ECE 445 *Digital Logic Synthesis*, Spring 2023
- ECE 102 *Digital Circuit Logic*, Spring 2023
- ECE 544 *Silicon Photonics for Computing Systems*, Fall 2022
- ECE 480A4 *Digital Logic Synthesis*, Spring 2022
- ECE 102 *Digital Circuit Logic*, Spring 2022
- ECE 544 *Silicon Photonics for Computing Systems*, Fall 2021
- ECE 102 *Digital Circuit Logic*, Spring 2021
- ECE 544 *Silicon Photonics for Computing Systems*, Spring 2021
- ECE 450/451 *Digital System Design*, Fall 2020
- ECE 480A4 *Digital Logic Synthesis*, Spring 2020
- ECE 102 *Digital Circuit Logic*, Spring 2020
- ECE 580B6 *Silicon Photonics for Computing Systems*, Fall 2019
- ECE 102 *Digital Circuit Logic*, Spring 2019
- ECE 580B6 *Silicon Photonics for Computing Systems*, Fall 2018
- ECE 102 *Digital Circuit Logic*, Spring 2018
- ECE 450/451 *Digital System Design*, Fall 2017

### 3.13 New Courses Developed at CSU

- ECE 480A4 (permanent code: 445) *Digital Logic Synthesis*
- ECE 580B6 (permanent code: 544) *Silicon Photonics for Computing Systems*. The course is supported by ANSYS Lumerical Inc., Synopsys, and Keysight to provide simulation tools and equipment for students.

### **3.14 Professional Development (Participated)**

Microaggressions and Inclusive Language, *Colorado State University*, Fort Collins, CO, Spring 2022

Uncovering Bias, *Colorado State University*, Fort Collins, CO, Spring 2022

Search Chair Training, *Colorado State University*, Fort Collins, CO, Spring 2021

Inclusive Pedagogy, *Colorado State University*, Fort Collins, CO, Spring 2021

Grant Writing Workshop, *Colorado State University*, Fort Collins, CO, Spring 2019

DAC Young Faculty Workshop, *IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA, Summer 2018

DAC Young Faculty Workshop, *IEEE/ACM Design Automation Conference (DAC)*, Austin, TX, Summer 2016

Clarifying Expectations for Supervision, *McGill University*, Montreal, Canada, Winter 2016

Crafting Your Research Future, *Center for Enhanced Learning and Teaching*, HKUST, Hong Kong, Spring 2013

Prepare for Your Academic Career, *Center for Enhanced Learning and Teaching*, HKUST, Hong Kong, Spring 2013

Modern Engineering Research Methodology, *Hong Kong University of Science and Technology*, Hong Kong, Spring 2012

Effective Research Process, *Hong Kong University of Science and Technology*, Hong Kong, Spring 2011

## **4 Professional Activities**

### **4.1 Editorial Activities**

2024–present

Guest Editor, npj Nanophotonics (Nature), Focus collection on “Advances in Optical Computing.”  
Focus Collection (special issue) on the subject of “Programmable Photonics”

2023–present

Guest Editor, Frontiers, Special issue on “Advances in Optical Computing.”

2023–2024

Guest Editor, IEEE/Optica Journal of Lightwave Technology, Special issue on “Photonic Computing.”

2021–present

Associate Editor, IEEE Transactions on VLSI Systems (TVLSI).

2020–2021

Guest Editor, MDPI Journal of Micromachines, Special issue on “Network-on-Chip Again on the Rise: From Emerging Applications to Emerging Technologies.”

2018–2019

Guest Editor, Elsevier Journal on Sustainable Computing (SUSCOM).

2017–2018

Guest Editor, ACM Journal on Emerging Technologies in Computing (JETC), Special Issue on “Emerging Networks-on-Chip: Designs, Technologies, and Applications.”

### **4.2 Conference/Workshop Steering Committee**

2018–present

North American Workshop on Silicon Photonics for High Performance Computing (SPHPC).

2015–present

International Workshop on Optical/Photonic Interconnects for Computing Systems (OPTICS).

### **4.3 Conference/Workshop General Chair**

2025

Optical Interconnects and Packaging (OIP) Conference.

2023

IEEE/ACM International Symposium on Networks-on-Chip (NOCS).

2018–present

North American Workshop on Silicon Photonics for High Performance Computing (SPHPC).

2019–2021

International Workshop on Optical/Photonic Interconnects for Computing Systems (OPTICS).

#### **4.4 Conference/Workshop Program Chair**

2024

IEEE International Forum on Multicore and Multiprocessor Systems-on-Chip (MPSoCs).

2022

IEEE/ACM International Symposium on Networks-on-Chip (NOCS).

2015–2018

International Workshop on Optical/Photonic Interconnects for Computing Systems (OPTICS).

#### **4.5 Conference/Workshop Organizing Committee**

2023

Finance Chair - International Forum on Multicore and Multiprocessor Systems-on-Chip (MPSoCs).

2021

Publication Chair - IEEE/ACM International Symposium on Networks-on-Chip (NOCS).

2019

Special Session Chair - ACM Great Lakes Symposium on VLSI (GLSVLSI) Conference.

2018–present

Student Travel Grant Chair - IEEE International Green and Sustainable Computing Conference (IGSC).

2018

Publicity Chair - International Workshop on Network-on-Chip Architectures (NoCArc).

2018

Publication Chair - IEEE Computer Society Annual Symposium on VLSI (ISVLSI).

2017–present

Ph.D. Forum Chair - IEEE International Green and Sustainable Computing Conference (IGSC).

#### **4.6 Technical Program Committee (TPC) Track Chair**

2020–2022

IEEE/ACM Design Automation Conference (DAC) for the Track EDA1—System-on-Chip Design Methodology.

#### **4.7 Technical Program Committee (TPC) Member**

2024

IEEE/ACM Design Automation and Test in Europe (DATE) Conference and Exhibition.

2024

IEEE Silicon Photonics Conference.

2024–present

IEEE/Optica Optical Fiber Communication (OFC) Conference.

- 2022–present  
IEEE/ACM International Conference on Computer Aided Design (ICCAD) - Student Research Competition.
- 2022–present  
IEEE/ACM International Conference on Computer Aided Design (ICCAD).
- 2021–present  
IEEE International Conference on VLSI Design (VLSID).
- 2021–present  
Ph.D. Forum - IEEE/ACM Design Automation and Test in Europe (DATE) Conference and Exhibition.
- 2019–present  
IEEE International System-on-Chip Conference (SOCC).
- 2020–present  
IEEE International Conference on Hardware/Software Codesign and System Synthesis (CODES+ISSS).
- 2019–present  
IEEE International Symposium on Quality Electronic Design (ISQED).
- 2020–present  
IEEE Workshop on Heterogeneity in Computing (HCW).
- 2018–2019  
IEEE/ACM Design Automation Conference (DAC).
- 2018–present  
ACM Great Lakes Symposium on VLSI (GLSVLSI).
- 2017–present  
IEEE International Green and Sustainable Computing Conference (IGSC).
- 2019  
IEEE Workshop on Photonics-Optics Technology Oriented Networking, Information and Computing Systems (PHOTONICS).
- 2019  
IEEE/ACM International Symposium on Networks-on-Chip (NOCS).
- 2018  
International Workshop on Network-on-Chip Architectures (NoCArc).
- 2018  
IEEE Computer Society Annual Symposium on VLSI (ISVLSI).
- 2018  
ACM SIGDA Ph.D. Forum - Design Automation Conference (DAC).
- 2018  
IEEE International Conference on High Performance Computing and Communications (HPCC).



2018

International Workshop on Advanced Interconnect Solutions and Technologies for Emerging Computing Systems (AISTECS).

#### 4.8 Conference/Workshop Technical Session Chair

2024

IEEE International Conference on Quantum Computing and Engineering: *Workshop on “Integrated Optics for Quantum Computing and Emerging Applications”*

2024

IEEE/Optica Conference on Lasers and Electro-Optics (CLEO): *Special session on “Silicon Photonics for Optical I/O, Artificial Intelligence, and High-Performance Computing”*

2024

IEEE/Optica Fiber Communication Conference (OFC): *Technical Session Tu3F: Optical Neural Networks*

2024

IEEE/Optica Fiber Communication Conference (OFC): *Workshop S1E: Co-Packaged Optics: Is It Only for the Cloud or Also for the Edge AI Services?*

2022

IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition: *Technical Session 10.1: Ph.D. Forum*

2021

IEEE/ACM Design, Automation and Test in Europe (DATE) Conference and Exhibition: *Technical Session 2.2: 3D integration: Today’s Practice and Road Ahead*

2020

IEEE/ACM International Conference On Computer Aided Design (ICCAD): *Technical Session 2C: Safety and Energy Optimizations for Cyber-Physical Systems*

2018

North American Workshop on Silicon Photonics for Computing Systems (SPHPC): *Technical Session IV: System-Level Architectures and Packaging*

2018

IEEE/ACM Design Automation Conference (DAC): *Technical Session 36: Emerging Storage and Memory Technologies*

2018

ACM Great Lakes Symposium on VLSI (GLSVLSI): *Technical Session 1: Emerging Computing, and Post-CMOS Technologies*

2018

IEEE International Green and Sustainable Computing Conference (IGSC): *Session 9B: Smart Buildings*

2017

International Workshop on Optical/Photonics Interconnects for Computing Systems (OPTICS): *Technical Session 2: Applications of Silicon Photonics*

2017

IEEE International Green and Sustainable Computing Conference (IGSC)

#### 4.9 Special Session/Workshop Organized

September 2024

Workshop on “Integrated Optics for Quantum Computing and Emerging Applications” at *IEEE Quantum Week*, Montreal, QC (co-organizers: K. Rahbardar Mojaver (CSU), O. Liboiron-Ladouceur (McGill University), S. Sharif (University of Oklahoma), A. Gyenis (University of Colorado, Boulder), S. Marzban (University of Twente), C. Taballione (Quix Quantum)).

May 2024

Special session on “Silicon Photonics for Optical I/O, Artificial Intelligence, and High-Performance Computing” at *IEEE/Optica Conference on Lasers and Electro-Optics (CLEO)*, Charlotte, NC (co-organizers: C. Huang (The Chinese University of Hong Kong), J. Yang (Western Digital), and S. Liu (Intel Labs)).

March 2024

Workshop on “Co-Packaged Optics (WS9): Is it Only for the Cloud or also for the Edge AI Services?” at *IEEE/Optica Optical Fiber Communication (OFC) Conference*, San Diego, CA (co-organizers: Shu Namiki (AIST) and Nicola Calabretta (Eindhoven University of Technology)).

July 2023

Topic on “Where Photonics Meets Computing: From Devices to Applications” at *IEEE Photonics Society Summer Topicals*, Sicily, Italy (co-organizers: A. Totovic (Celestial AI), M. Moralis-Pegios (Aristotle University), B. Tossoun (HPE), C. Huang (Chinese University of Hong Kong), and P. Bardella (Politecnico di Torino)).

February 2023

Workshop on “Photonics for AI and AI for Photonics” at *IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, Montreal, QC, Canada (co-organizers: K. Rahbardar Mojaver (McGill University), G. Nicolescu (Polytechnique Montreal), S. Pasricha (CSU), and A. Seyedi (NVIDIA)).

2020

Special Session on “Edge-to-Cloud Neural Networks for Machine Learning Applications in Future IoT Systems” at *IEEE/ACM Design Automation Conference (DAC)*, San Francisco, CA (co-organizers: R. Kim (CSU) and G. Nicolescu (Polytechnique Montreal)).

2019

Special Session on “Breaking the Ice Between Photonics Design and EDA: Electronic-Photonics Design Automation (EPDA)” at *IEEE/ACM International Conference on Computer Aided Design (ICCAD)*, Westminster, CO (co-organizer: U. Schlichtmann (Technical University of Munich)).

2018

Special Session on “Emergence of Silicon Photonics in High-Performance Computing: How can the VLSI Community Contribute?” at *ACM Great Lakes Symposium on VLSI (GLSVLSI) Conference*, Chicago, IL.

#### 4.10 Referee/Reviewer Activities

##### Funding Agencies:

*Natural Sciences and Engineering Research Council (NSERC), Canada, 2023.*

*National Science Foundation (NSF), CAREER, 2022.*

*National Science Foundation (NSF), Directorate for Engineering, 2022.*

*National Science Foundation (NSF), Directorate for Computer and Information Science and Engineering (CISE), 2022.*

*European Research Foundation - Flanders (FWO), 2020.*

*National Science Foundation (NSF), Directorate for Computer and Information Science and Engineering (CISE), 2020.*

*Natural Sciences and Engineering Research Council (NSERC), Canada, 2019.*

##### Ph.D. Thesis:

*Polarization Multiplexed Carrier based Self-Homodyne Coherent Optical Links. Dr. Rashmi Kamran, IIT Bombay, 2019.*

##### Books:

*Cambridge University Press*

##### Journals:

*Nature Photonics*

*ACM Transactions on Architecture and Code Optimization (TACO)*

*IEEE/ACM Transactions on Networking*

*IEEE Transactions on Communication*

*IEEE Photonics Technology Letters (PLT)*

*IEEE Journal on Lightwave Technology (JLT)*

*IEEE Transactions on Very Large Scale Integration (TVLSI)*

*IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems (TCAD)*

*IEEE Design and Test of Computers (D&T)*

*IEEE Transactions on Parallel and Distributed Systems (TPDS)*

*IEEE Transactions on Emerging Topics in Computing (TETC)*

*IEEE Transactions on Multi-Scale Computing Systems (TMSCS)*

*IEEE Transactions on Computers (TC)*

*IEEE Computer Architecture Letters (CAL)*

*ACM Transactions on Embedded Computing Systems (TECS)*

*ACM Journal on Emerging Technologies in Computing (JETC)*

*Elsevier Journal on Sustainable Computing (SUSCOM)*

*Elsevier Journal of Systems Architecture (JSA)*

*Elsevier Journal on Microprocessors and Microsystems (MICPRO)*

*Elsevier International Journal for Light and Electron Optics (OPTIK)*

*Elsevier Journal on Integration, the VLSI Journal (VLSI)*

*Elsevier Journal on Computer Physics Communications (CPC)*

*Elsevier Journal on Nano Communication Networks (NanoComNet)*

##### Conferences:

*Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS)*

*IEEE/ACM Design Automation Conference (DAC)*

*IEEE/ACM Design Automation and Test in Europe (DATE) Conference and Exhibition*

*Asia and South Pacific Design Automation Conference (ASP-DAC)*

*Embedded Systems Week (ESWEEK, CODES+ISSS, and CASES)*  
*IEEE International Conference on Computer Aided Design (ICCAD)*  
*IEEE Computer Society Annual Symposium on VLSI (ISVLSI)*  
*International Symposium on Networks-on-Chip (NOCS)*  
*IFIP/IEEE International Conference on Very Large Scale Integration (VLSI-SOC)*

#### **4.11 University, College, and Department Service**

- Committee: Faculty Award Committee, College of Engineering, CSU  
Activity: Member, 2023.
- Committee: Dean of Engineering Search Committee, CSU  
Activity: Member, 2022.
- Committee: Faculty Search Committee, Department of Electrical and Computer Engineering, CSU  
Activity: Member, 2022.
- Committee: Engineering Student Technology Committee (ESTC), College of Engineering, CSU  
Activity: Member, 2021 – present.
- Committee: Strategic Planning Development Committee (SPDC), College of Engineering, CSU  
Activity: Member and ECE department representative, 2021.
- Committee: Individual Development Plan and Mentoring, College of Engineering, CSU  
Activity: Member, 2019.
- Committee: Engineering Student Technology Committee (ESTC), College of Engineering, CSU  
Activity: Member, 2017 – 2019.